

Amendment and Response

Applicant: Anthony O. Banal et al.

Serial No.: 10/013,101

Filed: November 6, 2001

Docket No.: 10249US01

Title: MULTI-CAVITY OPTICAL DISC MOLD

REMARKS

This Amendment is responsive to the Office Action mailed May 7, 2003, in which claims 1-15 were rejected, claim 16 was objected to, and claims 17-20 were allowed. With this Response, claims 1 and 2 have been amended. Claims 1-20 remain pending in the application and are presented for reconsideration and allowance.

Claim Objection under 37 CFR 1.75(c)

Claim 2 was objected to under 37 CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 2 recites that the objects formed in the molds are optical discs. Written as such, the Examiner found the claim to only recite an intended use of the apparatus.

Claim 2 has been amended to specify that the at least two single cavity injection molds are optical disc molds. The amendment to claim 2 is believed to place the claim in proper dependent form. Accordingly, withdrawal of the objection to claim 2 under 37 CFR 1.75(c) is respectfully requested.

Claim Rejections under 35 U.S.C. § 102

Claims 1-2, 11-12, and 15 are rejected under 35 U.S.C. §102(b) as being anticipated by Shimazu et al. (U.S. Patent No. 5,648,105). Shimazu et al. is said to disclose a multiple cavity injection molding system for making optical discs. The system is said to comprise at least two single cavity injection molds (A) for forming discs (see Figure 1). Each of the molds is said to have a first mating portion (1) and a second mating portion (2) which are movable between a closed position in which a mold cavity is formed, and an open position in which the object is removed from the mold cavity (referencing Column 4, Lines 16-34). The molding system is said to be provided with a resin delivery system operatively coupled to the first mating portion of each of the injection molds for delivering resin into the two single cavity molds (referencing Column 5, Lines 18-44). The molding systems is also said to be provided with an ejector system

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operatively coupled to the second mating portion of the molds for ejecting the discs from the mold cavity (referencing Column 5, Lines 6-7 through Column 6, Line 5). The Examiner further details how Shimazu et al. discloses the subject matter of claims 11, 12, and 15.

Amended independent claim 1 claims a multiple cavity injection molding system comprising at least two single cavity injection molds for forming objects. Each single cavity injection mold has a first mating portion and a second mating portion which are movable between a closed position in which a mold cavity is formed, and an opened position in which the object is removed from the mold cavity. The first mating portions and second mating portions of each single cavity injection mold are all capable of moving independently from each other. A resin delivery system is operatively coupled to the first mating portion of each of the at least two single cavity injection molds for delivering resin into each of the single cavity injection molds. An ejector system is operatively coupled to the second mating portion of the at least two single cavity injection molds for ejecting the object from the mold cavity.

Shimazu et al. does not anticipate the subject matter of amended independent claim 1. In particular, Shimazu et al. does not teach an injection molding system where the first mating portions and second mating portions of each single cavity injection mold are all capable of moving independently from each other. This position is supported by the Examiner's comments at Page 10, Line 17 through Page 11, Line 2 of the Office Action, in which the Examiner states (with regard to allowed claim 17) that Shimazu et al. either alone or in combination with any other reference, does not teach the injection molding system with the cavity side and the core side of the first and second molds all capable of moving independent from each other. It is respectfully submitted that the above amendment to claim 1, specifying that the first mating portions and second mating portions of each single cavity injection mold are all capable of moving independently from each other, is similarly not taught or anticipated by Shimazu et al., either alone or in combination with any other reference. Accordingly, amended independent claim 1 is not anticipated by Shimazu et al., and withdrawal of the rejection of amended independent claim 1 under 35 U.S.C. §102(b) is respectfully requested. *

Dependent claims 2, 11, 12 and 15 each depend directly from amended independent claim 1. Because amended independent claim 1 is not anticipated by Shimazu et al. for the

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reasons discussed above, dependent claims 2, 11, 12 and 15 are also not anticipated by Shimazu et al., and withdrawal of the rejection of claims 2, 11, 12 and 15 under 35 U.S.C. §102(b) is respectfully requested.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 3-4, and 6-9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Gellert (U.S. Patent No. 4,891,001) in view of Boudreau et al. (U.S. Patent No. 6,036,472). Gellert is said to disclose a multiple cavity injection molding system. This system is said to comprise two single cavity injection molds (28), each injection mold having a first mating portion and a second mating portion which are movable between a closed position in which a mold cavity is formed and an opened position in which the object is removed from the mold cavity (referencing Figure 1 and Column 2, Lines 17-24). This system is further said to comprise a resin delivery system operatively coupled to the mating portion of each of the two molding cavities (referencing Column 2, Line 25 through Column 4, Line 6). Gellert is said to disclose the injection molds (28) to be separated from each other by an air gap (54) (referencing Figure 1 and Column 2, Lines 39-42). Gellert is also said to teach a coolant to be circulated through a passage (50) between the injection molds (referencing Column 2, Lines 37-39). Gellert is further said to not disclose the molding system comprising an ejector system operatively coupled to the second mating portion of the injection molds.

Boudreau et al. is cited as disclosing an injection molding system comprising two molding cavities. The system is further said to comprise ejectors (62a and 62b) for the purpose of providing the molding system with an efficient means to remove the molded objects (referencing Column 3, Lines 46-50).

The Examiner finds it to have been obvious to one of ordinary skill in the art at the time of Applicants' invention to have modified the apparatus of Gellert to comprise ejectors because this would have allowed for efficient removal of the molded objects as suggested by Boudreau et al.

It is respectfully submitted that amended independent claim 1 is not obvious over the combination of Gellert and Boudreau et al. As noted above, amended independent claim 1 now

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specifies that the first mating portions and second mating portions of each single cavity injection mold are all capable of moving independently from each other. As also noted above, at Page 10, Line 17 through Page 11, Line 2 of the Office Action, the Examiner states that the closest prior art is taught by Shimazu et al. and Gellert. Writing with regard to allowed claim 17, the Examiner found that Shimazu et al. and Gellert with any combination of the other references do not teach an injection molding system with the cavity side and the core side of the first and second molds all capable of moving independent from each other. It is respectfully submitted that the above amendment to claim 1, specifying that the first mating portions and second mating portions of each single cavity injection mold are all capable of moving independently from each other, is similarly not taught or anticipated by Gellert, either alone or in combination with any other reference. Accordingly, amended independent claim 1 is not obvious over the combination of Gellert and Boudreau et al., and withdrawal of the rejection of amended independent claim 1 under 35 U.S.C. §103(a) is respectfully requested.

Claims 3, 4 and 6-9 are directly or indirectly dependent upon amended independent claim 1. As discussed above, amended independent claim 1 is now in condition for allowance. Therefore, withdrawal of the rejection of dependent claims 3, 4 and 6-9 under 35 U.S.C. §103(a) is also requested

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Gellert and Boudreau et al. as applied to claims 1, 3-4, and 6-9, and further in view of Miyazawa et al. (U.S. Patent no. 5,232,710). Gellert and Boudreau et al. are said to disclose the apparatus as described above with regard to claims 1, 3-4, and 6-9, including the use of air as an insulator between the two mold cavities. However, Gellert and Boudreau et al. do not disclose the material between the two molds to be a ceramic.

Miyazawa et al. is cited as teaching that the equivalent insulative properties of air in ceramics are known in the injection molding art (referencing Column 9, Lines 1-5).

The Examiner finds it would have been obvious to one of ordinary skill in the art at the time of the Applicants' invention to have modified the apparatus of Gellert and Boudreau et al. as such to have used a ceramic between the two molds as opposed to air, because ceramics are known in the art as an equivalent insulator to air as suggested by Miyazawa et al.

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As discussed above, amended independent claim 1 (from which claim 5 indirectly depends) is not obvious over the combination of Gellert and Boudreau et al. Because claim 1 is not obvious over the combination of Gellert and Boudreau et al., neither is claim 5 made obvious by the combination of Gellert, Boudreau et al. and Miyazawa et al. Therefore, withdrawal of the rejection of dependent claim 5 under 35 U.S.C. §103(a) is respectfully requested.

Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Shimazu in view of Takahashi et al. (U.S. Patent No. 5,388,982). Shimazu et al. is said to teach the apparatus as described above with respect to claims 1-2, 11-12, and 15, but does not disclose the mating portions of each of the injection molds to independently center the molds upon moving to the closed position.

Takahashi et al. is cited as disclosing a multi-cavity injection mold for making optical discs. Takahashi et al. is said to teach the two molds to independently center themselves as the molds are closed (referencing Column 8, Lines 28-44). Takahashi et al. is further said to disclose that this allows for the molding of discs with highly accurate dimensions (referencing Column 8, Lines 45-50).

The Examiner states it would have been obvious to one of ordinary skill in the art at the time of the Applicants' invention to have modified the apparatus of Shimazu et al. such as to have the two molds independently center themselves as the molds are closed because this would help mold a disc with accurate dimensions as suggested by Takahashi et al.

As discussed above, amended independent claim 1 (from which claim 10 directly depends) is not taught by Shimazu et al. and is in allowable condition. Because claim 10 depends from now allowable amended independent claim 1, claim 10 is also in allowable condition. Therefore, withdrawal of the rejection of dependent claim 10 under 35 U.S.C. §103(a) is respectfully requested.

Claims 13-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over Shimazu et al. in view of Stell et al. (U.S. Patent no. 6,368,542). Shimazu et al. is cited as teaching the apparatus of claim 1, but is acknowledged as not disclosing the first mating portion of the injection molds to be resiliently coupled to the resin delivery system by the use of Belleville washers.

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Steil et al. is cited as disclosing an injection molding apparatus. Steil is said to teach the mold comprising a mold block (12) and a resin delivery system (18). The mold block is said to be resiliently coupled to the resin delivery system by the use of Belleville washers (68) for the purpose of allowing for the thermal expansion of the resin delivery system (referencing Column 2, Lines 47-58).

The Examiner finds it would have been obvious to one of ordinary skill in the art at the time of the Applicants' invention to have modified the apparatus of Shimazu et al. such as to have resiliently coupled the mating portions of the injection molds to the resin delivery system using Belleville washers, because this would have allowed for thermal expansion of the resin delivery system as suggested by Steil et al.

As discussed above, amended independent claim 1 (from which claims 13 and 14 either directly or indirectly depend) is not taught by Shimazu et al. and is in allowable condition. Because claims 13 and 14 depend from now allowable amended independent claim 1, claims 13 and 14 are also in allowable condition. Therefore, withdrawal of the rejection of dependent claims 13 and 14 under 35 U.S.C. §103(a) is respectfully requested.

Allowable Subject Matter

Claim 16 was objected to as being dependent upon a rejected base claim, but was indicated to be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims. Claim 16 depends indirectly from amended independent claim 1, which is allowable for the reasons discussed above. Accordingly, dependent claim 16 is also believed to be in allowable condition as presently written, and Applicants respectfully decline to rewrite claim 16 in independent form at this time.

In light of the above, Applicants believe independent claim 1 and the claims depending therefrom, are in condition for allowance. Allowance of these claims is respectfully requested.

Claims 17-20 were indicated to be allowed. Applicants respectfully acknowledge Examiner's allowance of claims 17-20.

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GROUP 1700**CONCLUSION**

It is believed that all claims of the application are now in condition for allowance. Notice to that effect is respectfully requested.

No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 09-0069.

The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number if there are any questions regarding this response.

Respectfully submitted,

Date: _____

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